



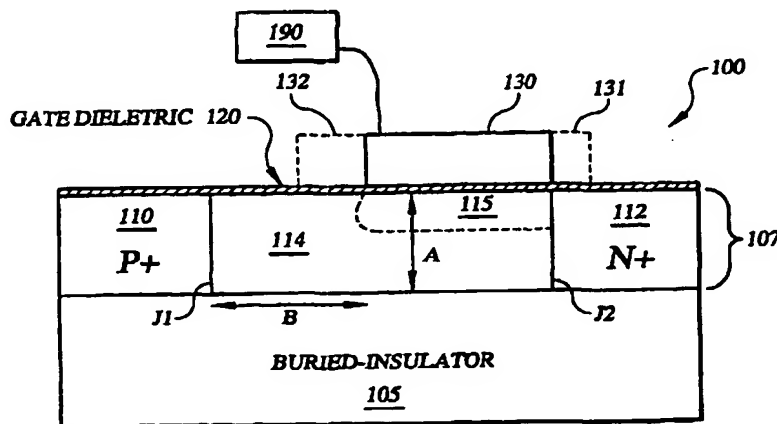
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ning of each regular issue of the PCT Gazette.*

(54) Title: INSULATED-GATE SEMICONDUCTOR DEVICE AND APPROACH INVOLVING JUNCTION-INDUCED INTER-MEDIATE REGION



(57) Abstract: Semiconductor device performance is improved via an insulated-gate PIN-type structure (100) that is adapted to abruptly switch between conduction states by modulating an electric field in the intermediate region (114). According to an example embodiment of the present invention, an insulated gate-type structure (100) includes a body (107) with first (110) and second (112) end regions and an intermediate region (114) coupled therebetween, the intermediate region (114) having a length defined by junctions at the first (110) and second (112) regions. The first (110) and second (112) end regions have opposite

polarizations and the intermediate region (114) has a polarization that is neutral relative to the polarizations of the first and second end regions. The insulated gate-type structure (100) also includes a gate (130) that is coupled to the intermediate region (114) and adapted, with the intermediate region, to apply an electric field nearer one of the two junctions. With the body reverse biased, the electric field can be modulated to switch the structure (100) between a stable state and a current-conducting state in which an avalanche breakdown occurs in the intermediate region (114).

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A. CLASSIFICATION OF SUBJECT MATTER

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US CL : 257/262, 322, 327, 403

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/262, 322, 327, 403

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
East Search (USPAT, EPO, JPO, DERWENT, IBM TDB)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,985,727 A (BURR) 16 November 1999 (16.11.1999), figs. 1-2, columns 4,7-10	1-20, 38-43
X	US 5,677,215 A (GOO) 14 October 1997 (14.10.1997), Fig. 8, columns 3-4	21-36
X	US 4,062,699 A (ARMSTRONG) 13 December 1977 (13.12.1977), Fig. 5a, column 5	37
A	US 6,294,818 A (FUJIHARA) 25 September 2001 (25.09.2001), complete document	1-43
A	US 6,078,082 A (BULUCEA) 20 June 2000 (20.06.2000), complete document	1-43
A	US 6,452,231 B1 (NAKAGAWA et al) 17 September 2002 (17.09.2002), complete document	1-43

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